Funding Sources

List of funding sources for private landowners/community groups.

Directory of Environmental Grantmaking Foundations
Available from: Environmental Data Research Institute
P.O. Box 22770
Rochester, NY 14692-2770
800-724-1857
E-mail: edri@eznet.net

Directory of Indiana Grantmakers
Available from: Indiana Donors Alliance
32 East Washington St., #1100
Indianapolis, IN 46204-3583
317-630-5200
E-mail: info@indonors.com
Website: www.indonors.com

See the "Grants/Funding" section of the EPA Wetlands Information Hotline Publication List, or call the hotline at 1-800-832-7828.

Visit www.epa.gov/owow.

Land Trusts and Other Land Acquisition Entities

Shirley Heinze Environmental Fund
444 Barker Road
Michigan City, IN 46360

ACRES Land Trust
2000 North Wells Street
Fort Wayne, IN 46808

NICHES
PO Box 2790
West Lafayette, IN 47906-2790

Central Indiana Land Trust, Inc.
PO Box 509074
Indianapolis, IN 46250

Sycamore Land Trust
PO Box 7801
Bloomington, IN 47407-7801

Wawasee Area Conservancy Foundation
6938 East Waco Drive
Syracuse, IN 46567

The Nature Conservancy
1330 West 38th Street
Indianapolis, IN 46208

Indiana Karst Conservancy
PO Box 2401
Indianapolis, IN 46206-2401

Wetland Plant Suppliers For The Indiana Region

This list of consultants has been compiled by the Indiana DNR Division of Soil Conservation to assist persons seeking consulting services for enhancement of natural resources. It does not include all practicing professionals, but lists only those who have expressed an interest in providing such services and have contacted the Division to specifically request that their names be placed on the enclosed list. The Division does not test for effectiveness, endorse, make any express or implied warranties, or otherwise accept any responsibility for any products or services sold, provided, or recommended by the listed groups.

Native Wetland Nurseries

Applied Ecological Services, Inc.
Taylor Creek Restoration Nurseries
17921 Smith Road
P.O. Box 256
Brodhead, WI 53520
608-897-8641
608-897-8486 fax

J.F. New & Associates
Native Plant Nursery
128 Sunset Dr.
Walkerton, IN 46574
219-586-2412
219-586-3400 fax

Kester's
Wild Game Food Nurseries, Inc.
P.O. Box 516
Omro, WI 54963
414-685-2929

Lafayette Home Nursery, Inc.
R.R. 1, Box 1A
Lafayette, IL 61449
309-995-3311

Spence Landscaping and Nursery, Inc.
PO Box 546
Muncie, IN 47308
317-286-1754
317-286-0264 fax

Wetland Supply Co.
1633 Gilmar Road
Apollo, PA 15613
724-327-1830
724-733-3527 fax

Wildlife Nurseries, Inc.
P.O. Box 2724
Oshkosh, WI 54903
414-231-3780

Other Wetland Plant Suppliers

Aquarius Water Gardens
(Div. of Ramsey Feed & Seed)
1480 Hwy. 64 NW
Ramsey, IN 47166-0005
800-322-2191
812-347-2293 fax

Crystal Palace Perennials, Ltd.
P.O. Box 154
St. John, IN 46373
219-374-9419
219-374-9052 fax

Rev. 7/7/99, gmw

Indiana's Wetland Resources

Wetlands occur in and provide benefits to every county in Indiana (Figure 1). The lack of quantitative information on some aspects of Indiana's wetland resources is a major obstacle to improving wetland conservation efforts.

The most extensive database on wetland resources in Indiana is the National Wetlands Inventory developed by the U.S. Fish and Wildlife Service. In 1985, the Indiana Department of Natural Resources, Division of Fish and Wildlife entered into a cooperative agreement with the U.S. Fish and Wildlife Service to share the costs of mapping Indiana's wetlands.

Indiana's National Wetlands Inventory maps were produced primarily from interpretation of high-altitude color infrared aerial photographs (scale of 1:58,000) taken of Indiana during spring and fall 1980-87. Map production also included field investigations, review of existing information, quality assurance, draft map production, interagency review of draft maps, and final map production.

National Wetland Inventory maps indicate wetlands by type, using the classification system developed by Cowardin *et al.* (1979. Classification of wetlands and deepwater habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31. 104 pp.). The minimum wetlands size on National Wetland Inventory maps is generally one to three acres. Very narrow wetlands in river corridors and wetlands that were cultivated at the time of mapping are generally not depicted, and forested wetlands are poorly discriminated.

The most recent and complete analysis of this database was conducted in 1991 by the Indiana Department of Natural Resources. According to the report, Indiana had approximately 813,000 acres of wetland habitat in the mid-1980s when the data were collected. The extent of wetland loss or gain since that time is unknown.

Wetland habitats	Acres	% of total
scrub-shrub	42,131	5.2%
forested	504,336	62.0%
wet meadow	55,071	6.8%
shallow marsh	67,564	8.3%
deep marsh	20,730	2.5%
open water	98,565	12.1%
other	24,633	3.0%
total wetland habitats	813,032	100.0%

From Rolley, R. E. 1991. Indiana's Wetland Inventory. IDNR Wildlife Management and Research Notes no. 532. 6 pp.

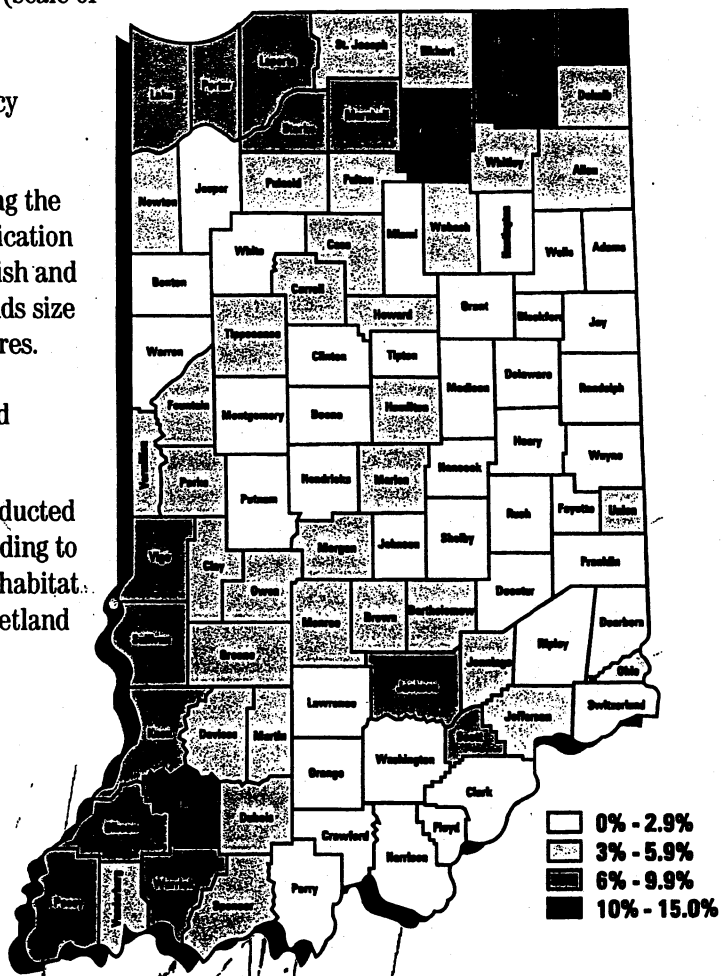


Figure 1. Distribution and density (percent acreage) of wetlands and deepwater habitats in Indiana by county, based on the National Wetland Inventory.

Map by Shelley Lin, IDNR-MIS, 1996

WETLAND FIELD SITES

Note: The following list of wetland field sites is provided to ***Integrated Environmental Curriculum*** users as potential sites for wetland study. This is not a comprehensive list of all wetland sites available. In addition, not all of the sites have been visited by IEC developers. If you visit these sites, please share your evaluation of their usefulness, in regards to wetland study, with the IEC developers. Please let us know of any other sites that we should add. IEC partner contacts are listed in the Wetland Education Resource List.

Adams County

St. Mary's River
Contact: Decatur Parks & Recreation
231 East Monroe Street
Decatur, IN 46733
(219) 724-2520

Allen County

Fox Island County Park
Contact: Allen County Parks & Recreation
7324 Yohne Road
Fort Wayne, IN 46809
(219) 747-7846

Crawford County

Patoka Lake (IDNR)
R.R. 1, Box 290
Birdseye, IN 47513
(812) 685-2464

Daviess County

Glendale Fish & Wildlife Area
R.R. 2, Box 300
Montgomery, IN 47558
(812) 644-7711

Dubois County

Barnes-Seng Wetlands Conservation Area
Contact: Indiana Dept. of Natural Resources
Division of Fish & Wildlife
(317) 232-4080

Patoka Lake (IDNR)
R.R. 1, Box 290
Birdseye, IN 47513
(812) 685-2464

Elkhart County

Elkhart Environmental Center
1717 East Lusher Avenue
Elkhart, IN 46516
(219) 293-5070

Studebaker Park/River Greenway Trail
Contact: Elkhart Parks & Recreation
131 Tyler Street
Elkhart, IN 46516
(219) 295-7275

Pipewort Pond
Contact: Indiana Dept. of Natural Resources
Division of Nature Preserves
(317) 232-4052

Shoup-Parsons Swamp Woods
Contact: Goshen Parks & Recreation
607 West Plymouth Avenue
Goshen, IN 46526
(219) 534-2901

Fulton County

Manitou Islands
Contact: Indiana Dept. of Natural Resources
Division of Nature Preserves
(317) 232-4052

Henry County

Wilbur Wright Fish & Wildlife Area
R.R. 4, Box 5A
New Castle, IN 47362
(317) 529-9581

Howard County

Kokomo Reservoir
Contact: Kokomo Parks & Recreation
1402 West Deffenbaugh
Kokomo, IN 46902
(317) 456-PARK

Huntington County

Salamonie Lake (IDNR)
9214 West-Lost Bridge West
Andrews, IN 46702-9731
(219) 468-2125

Huntington Lake (IDNR)
517 North Warren Road
Huntington, IN 46750
(219) 468-2165

Jackson County

Muscatatuck National Wildlife Refuge
12985 East U.S. 50
Seymour, IN 47274
(812) 522-4352

Jasper County

Jasper-Pulaski Fish & Wildlife Area
R.R. 1, Box 216
Medaryville, IN 47957
(219) 843-4841

Jennings County

Muscatatuck National Wildlife Refuge
12985 East U.S. 50
Seymour, IN 47274
(812) 522-4352

Crosley Fish & Wildlife Area
R.R. 2, Box 87
North Vernon, IN 47265
(812) 346-5596

Johnson County

Atterbury Fish & Wildlife Area
Edinburgh, IN 46142
(317) 232-7535

Province Park
Contact: Franklin Parks & Recreation
101 Hurricane Street
Franklin, IN 46131
(317) 736-3689

Knox County

Oubache Trails Park
Contact: Knox County Parks & Recreation
R.R. 6, Box 227H
Vincennes, IN 47591
(812) 882-4316

Kosciusko County

Wawasee Wetlands Conservation Area
Center Lake Wetlands Conservation Area
Tri-County Wetlands Conservation Area
Contact: Indiana Dept. of Natural Resources
Division of Fish & Wildlife
(317) 232-4080

Big Chapman Lake
Little Chapman Lake
Contact: Indiana Dept. of Natural Resources
Division of Nature Preserves
(317) 232-4052

LaGrange County

Maple Wood Nature Preserve
Dallas Lake Park
Delt Church Park
Contact: Maple Wood Nature Center
114 West Michigan Street
LaGrange, IN 46761
(219) 463-4022

Pigeon River Fish & Wildlife Area
Mongo, IN 47598
(219) 367-2164

Lake County

Beaver Dam Wetlands Conservation Area
Contact: Indiana Dept. of Natural Resources
Division of Fish & Wildlife
(317) 232-4080

Hoosier Prairie
Contact: Indiana Dept. of Natural Resources
Division of Nature Preserves
(317) 232-4052

LaSalle Fish & Wildlife Area
R.R. 2, Box 80
Lake Village, IN 46349
(219) 992-3019

Gibson Woods Nature Preserve
6201 Parrish
Hammond, IN 46323
(219) 844-3188

Indiana Dunes National Lakeshore
1100 North Mineral Springs Road
Porter, IN46304-1299
(219) 926-7561

Bonnie Lake
Contact: Lowell Parks & Recreation
501 East Main Street
Lowell, IN 46356
(219) 696-1570

LaPorte County

Galena Wetlands Conservation Area
Contact: Indiana Dept. of Natural Resources
Division of Fish & Wildlife
(317) 232-4080

Luhr County Park
3178 South County Road 150 W.
LaPorte, IN 46350
(219) 324-5855

Kingsbury Fish & Wildlife Area
5344 South Hupp Road
LaPorte, IN 46350
(219) 393-3612

Marshall County

Menominee Wetlands Conservation Area
Maxinkuckee Wetlands Conservation Area
Contact: Indiana Dept. of Natural Resources
Division of Fish & Wildlife
(317) 232-4080

Monroe County

Karst Farm Park
Contact: Monroe County Parks & Recreation
119 West Seventh Street
Bloomington, IN 47404
(812) 349-2899

Muscatatuck National Wildlife Refuge- Restle Unit
12985 East U.S. 50
Seymour, IN 47274
(812) 522-4352

Monroe Lake (IDNR)
4850 South State Road 446
Bloomington, IN 47401
(812) 349-2899

Morgan County

privately owned wetlands is available for school groups to use
Contact: Dee Terrell (812) 342-0852

Newton County

Willow Slough Fish & Wildlife Area
R.R. 2
Morocco, IN 47963
(219) 285-2704

Noble County

Rome City Wetlands Conservation Area
Mallard Roost Wetlands Conservation Area
Eagle Lake Wetlands Conservation Area
Contact: Indiana Dept. of Natural Resources
Division of Fish & Wildlife
(317) 232-4080

Bixler Lake Park
Contact: Kendallville Park & Recreation
211 Iddings Street
P.O. Box 516
Kendallville, IN 46755
(219) 347-1064

Orange County

Patoka Lake (IDNR)
R.R. 1, Box 290
Birdseye, IN 47513
(812) 685-2464

Pike County

Patoka Fish & Wildlife Area
R.R. 1
Winslow, IN 47598
(812) 789-2724

Porter County

Indiana Dunes State Park
1600 North 25 E.
Chesterton, IN 46304
(219) 926-1952

Indiana Dunes National Lakeshore
1100 North Mineral Springs Road
Porter, IN 46304-1299
(219) 926-7561

Sunset Hill Farm Park
Contact: Porter County Parks & Recreation
155 Indiana Avenue
Valparaiso, IN 46383
(219) 465-3586

Moraine Nature Preserve
Contact: Then Nature Conservancy
1330 West 38th Street
Indianapolis, IN 46208-4103
(317) 923-7547

Langeluttig Wetlands Conservation Area
Contact: Indiana Dept. of Natural Resources
Division of Fish & Wildlife
(317) 232-4080

Posey County

Gray Estate Cypress Slough
Twin Swamps Nature Preserve
Contact: Indiana Dept. of Natural Resources
Division of Nature Preserves
(317) 232-4052

Goose Pond Cypress Slough
Contact: The Nature Conservancy
1330 West 38th Street
Indianapolis, IN 46208-4103
(317) 923-7547

Hovey Lake Fish & Wildlife Area
R.R. 5
Mt. Vernon, IN 47620
(812) 838-2927

Pulaski County

Jasper-Pulaski Fish & Wildlife Area
R.R. 1, Box 216
Medaryville, IN 47957
(219) 843-4841

Winamac Fish & Wildlife Area
R.R. 4
Winamac, IN 46996
(219) 946-4422

St. Joseph County

Spicer Lake Nature Preserve
County Line Road, New Carlisle, IN
Contact: St. Joseph County Parks & Recreation
(219) 654-3155

Potato Creek State Park
25601 State Road 4
North Liberty, IN 46554
(219) 656-8186

Starke County

Round Lake Wetlands Conservation Area
Koontz Lake Wetlands Conservation Area
Contact: Indiana Dept. of Natural Resources
Division of Fish & Wildlife
(317) 232-4080

Kankakee Fish & Wildlife Area
16591 South 250 W.
Hanna, IN 46340
(219) 896-3522

Steuben County

Cedar Swamp Wetlands Conservation Area
Ropchan Wetlands Conservation Area
Marsh Lake Wetlands Conservation Area
Jimmerson Lake Wetlands Conservation Area
Contact: Indiana Dept. of Natural Resources
Division of Fish & Wildlife
(317) 232-4080

Pokagon State Park
450 Lane 100 Lake James
Angola, IN 46703
(219) 833-2012

Loon Lake
Contact: Indiana Dept. of Natural Resources
Division of Nature Preserves
(317) 232-4052

Sullivan County

Minnehaha Fish & Wildlife Area
R.R..5, Box 21C
Sullivan, IN 47882
(812) 268-5640

Dugger Unit/Greene-Sullivan State Forest
R.R. 1, Box 382
Dugger, IN 47848
(812) 648-2810

Wabash County

Salamonie Lake (IDNR)
9214 West-Lost Bridge West
Andrews, IN 46702
(219) 468-2125

Laketon Bog
Contact: Indiana Dept. of Natural Resources
Division of Nature Preserves
(317) 232-4052

Warrick County

Little Pigeon Creek Wetlands Conservation Area
Contact: Indiana Dept. of Natural Resources
Division of Fish & Wildlife
(317) 232-4080

Wayne County

Springwood Lake Conservation Park
Contact: Richmond Parks & Recreation
50 North Fifth Street
Richmond, IN 47374

Whitley County

Crooked Lake
Contact: Indiana Dept. of Natural Resources
Division of Nature Preserves
(317) 232-4052

Integrated Environmental Curriculum

U.S. Fish & Wildlife Service • Sierra Club Wetlands Project
The Nature Conservancy • Oakhurst Gardens
Indiana Native Plant and Wildflower Society

U.S. Fish & Wildlife Service, 620 South Walker Street, Bloomington, IN 47403
PHONE (812) 334-4261 FAX (812) 334-4273

The Integrated Environmental Curriculum Project

BACKGROUND

In the early 1990's, the Indianapolis Zoo, Sierra Club Wetlands Project, and U.S. Fish and Wildlife Service formed the Integrated Environmental Curriculum (IEC) partnership. They began working with teachers from the Ft. Wayne (Indiana) School Corporation to develop a wetland-based thematic curriculum as the first of several proposed components of the IEC project. The IEC partnership is unprecedented in the diverse organizations it has brought together to develop an education product. We have a distinguished group of cooperating organizations, including the Indiana Department of Education, the Indiana Department of Natural Resources, and various University partners committed to the long-term success of the project.

GOAL STATEMENT

* The IEC will provide a knowledge base to empower children to understand environmental issues and make informed decisions on environmental questions.

* The IEC will function as a tool for the development of critical thinking skills in an environmental education context.

* The IEC will provide an interdisciplinary approach designed to attract those teachers without a strong existing interest in environmental education.

* The IEC will strive for technical accuracy and value neutrality.

IEC WETLANDS COMPONENT

Wetlands Overview

Wetland scientists recognize that abundant, diverse, and functioning wetlands provide a broad range of benefits to society. Wetland values have been accepted even by multidisciplinary forums (National Wetlands Policy Forum 1988). However, wetlands have declined at a rate alarming to the scientific community. A FWS report (Dahl 1990) lists 22 states that have lost 50% or more of their original wetlands with ten states, including Indiana (87%), having lost 70% or more. A contributing factor to wetland loss is ignorance of the value of wetlands. While more awareness of wetlands exists, we still perceive widespread misconceptions concerning the role of wetlands and indifference toward the values they provide. Without question, the future protection and restoration of wetlands and other natural systems will require a more enlightened citizenry.

Integrated Environmental Curriculum (cont'd)

A Wetlands Theme for Education

We submit that wetlands offer a unique focal point for an innovative approach to environmental education for school students. Wetlands study provides an exciting foundation for a theme-based, interdisciplinary curriculum. Wetlands occur in literature, provide an imaginative basis for art and music projects, and lend themselves well to the development of geography, math and basic science skills. Furthermore, wetlands provide a teaching paradigm for other natural systems. Wetlands display various ecological functions that are valued by society; wetlands have undergone severe human disturbance; and mechanisms exist to restore damaged wetland ecosystems.

Wetlands Component Description

The IEC Wetlands Activity Guide is an interdisciplinary, K-12 curriculum based on Midwestern freshwater wetlands. It includes classroom and field activities, references, a wetlands field site list, and other supporting material. The curriculum has undergone a review process by resource and education professionals. In addition, the Indiana Department of Education has assigned state curriculum proficiencies to each activity.

IEC partners have also worked to broaden the effective use of the Wetlands Activity Guide. Indiana University's Center for Excellence in Education and School for Public and Environmental Affairs are using the curriculum in a pilot project to provide environmental education on the World Wide Web. The Center for Educational Curriculum and Indianapolis Zoo are using the Guide for a pilot project to develop Distance Learning (two-way, interactive video) technology within an educational context. Ball State University also used activities from the curriculum in a Study Guide to accompany a documentary video about Indiana author, Gene Stratton-Porter.

Grasslands Component Description

In 1997, the IEC Grassland Partnership was initiated with the FWS, Indiana Native Plant and Wildflower Society, Oakhurst Gardens, and The Nature Conservancy to develop and implement the second IEC component, Grasslands. Purdue University's School Mathematics and Science Center is currently assisting a team of teachers, representing elementary, middle and high school as well as science and nonscience disciplines, to develop the IEC Grasslands Activity Guide.

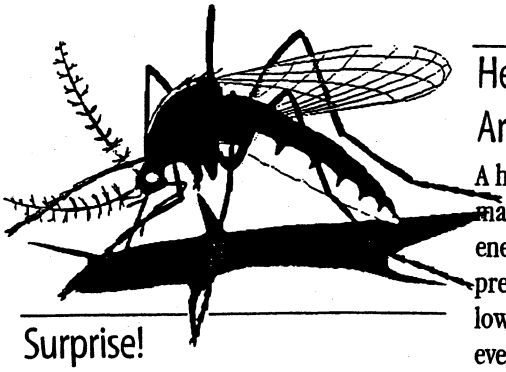
FOR MORE INFORMATION

The IEC Wetlands Activity Guide can be obtained by attending an IEC Wetlands Workshop. Workshops are typically offered in the spring and fall. To obtain information about upcoming workshops, contact Barbara Hosler, IEC Coordinator, at (812) 334-4261 extension 209.

CONCLUSION

Global environmental problems face the world and will require long term, innovative solutions. Children must have the critical-thinking and problem-solving skills necessary to act capably when they become full decision makers. This is the challenge and goal of the IEC.

Did You Know? . . . Healthy Wetlands Devour Mosquitoes



Surprise!

Contrary to popular belief, healthy, functioning wetlands can actually *reduce* mosquito populations.

But Everybody Says . . .

Mosquito control programs commonly recommend that wetlands be drained in order to control mosquitoes. This is because mosquitoes require standing water to breed, and if there is no standing water, there will be no mosquitoes. Quite true. However, mosquitoes have a very short life cycle (from 4 days to a month), and their eggs can remain dormant for more than a year, hatching when flooded with water. Therefore, even after a wetland has been drained, it may still hold enough water after a rain to breed mosquitoes. The *drained* area may actually produce more mosquitoes than it did when it was a wetland!

Healthy Wetlands Versus Wet Areas and Standing Water

A healthy wetland provides habitat for many unique animals including natural enemies of mosquitoes. These natural predators keep the mosquito population low. Mosquitoes become a problem, however, in areas that have standing water, yet do not support the beneficial animals that feed on mosquitoes. Most any kind of wet area or standing water makes a good breeding site for mosquitoes: old tires, cans, and other containers that collect rainfall; even hollow logs that hold water, and low spots in the ground where water pools. And because these types of places do *not* provide good homes for those beneficial insects and other kinds of wildlife that feed on mosquitoes, the mosquitoes quickly reproduce out of control.

The Balance of Nature

Mosquito populations are held in check in healthy wetlands. Certain birds, frogs, fish, and insects live in these wetlands and feed on mosquito larvae and/or adults.

The following insects are natural enemies of mosquitoes:

- *Dragonflies*
- *Damselflies*
- *Water Striders*
- *Backswimmers*
- *Predacious Diving Beetles*

But these insects need proper habitat (healthy wetlands) to survive. You won't find them in the typical areas where mosquitoes thrive--small spots of open, standing water and other wet areas where mosquitoes can become thick as fog.

Reduce Mosquito Populations Restore A Wetland!

Wetland restoration decreases mosquito populations in two ways: by providing proper habitat for the natural enemies of mosquitoes, and by preventing or reducing flooding (in areas that aren't normally wet and thus support mosquitoes but not their predators). When the Essex County Mosquito Control Project restored a 1,500 acre wetland in Massachusetts, the mosquito population *dropped by 90 percent*. The experts there know that wetland restoration is synonymous with genuine mosquito control (Audubon Magazine, November-December 1996). And in Indiana, the most serious mosquito problems tend to occur in floodwaters and woodland pools. So by restoring healthy wetlands, we really can do ourselves and all Hoosiers a big favor!

Make a Lasting Improvement

If you own or manage drained wetlands, you can expect "blooms" of mosquitoes after every rain. If you're tired of donating blood, consider restoring or creating a healthy wetland. Within days, natural predators of mosquitoes will begin to return. Not only will you be reducing the mosquito population, you'll also be

creating excellent wildlife habitat, reducing the likelihood of flooding on adjacent ground, improving water quality, and possibly other benefits as well!

Quick Fix

If you've determined that you really need a "quick fix" for your mosquito problem, at least try to use the more environmentally friendly methods.
Here are two:

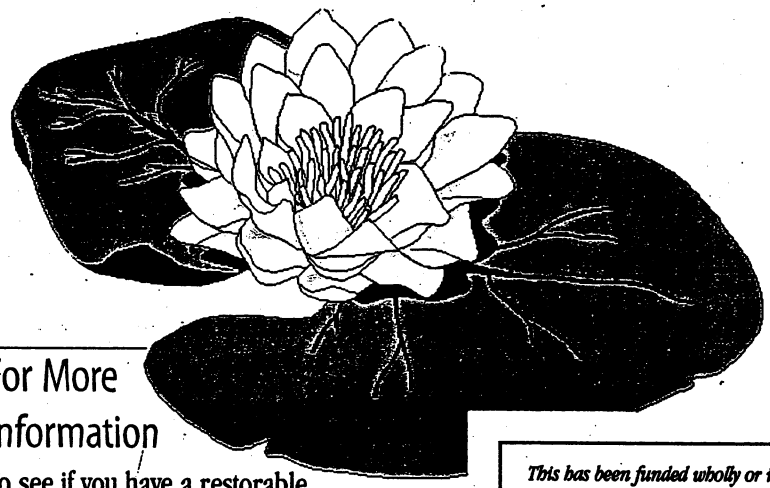
- *Bacillus thuringiensis israelensis (Bti)*
  is a bacterium that can be used in almost any aquatic habitat with no restrictions. It is fast acting and quickly biodegrades. The timing of its application is critical to its effectiveness.
- S-methoprene is a synthetic mimic of an insect hormone. It is safe for workers and degrades into simpler compounds.

Remember that these methods are not permanent or long lasting, but must be repeated for effective control.

Smart Economics

It pays to control mosquitoes in an environmentally friendly way. New Jersey has been controlling mosquitoes "the natural way" by using a technique called Open Marsh Water Management (OMWM). This technique controls mosquito larvae by eliminating breeding depressions (low areas where water pools) and by increasing natural enemies of mosquitoes. Insecticides are not used. The Cape May County Mosquito Extermination Commission reported spending approximately $16,000 to implement the OMWM method on a 548-acre marsh in 1969. This was a one-time expense because 25 years later, the marsh still had not needed maintenance, cleaning, or pesticides. The Commission estimated that the cost to use traditional insecticide methods (repeatedly treating the area with chemicals) over the same period would have been $685,000. OMWM resulted in a savings of $669,000--over 97 percent! (www.umaa.org/ecomosco. htm)

In a separate economic study, The Commission compared a range of costs for OMWM with the cost of traditional larvicide methods for the estimated 20-year life of the OMWM method. The cost ranges for OMWM were $5 to $63 per acre. The cost of using larvicide was $286 per acre. OMWM resulted in a savings of from $222 to $280 per acre or 78 to 98 percent! *(The Economics of Marsh Water Management* - A New Jersey View, Proceedings of the 63rd Annual Meeting, NJ Mosquito Extermination Association.)



For More Information

To see if you have a restorable wetland on your property, contact the Indiana Department of Natural Resources:

IDNR Division of Fish and Wildlife
Room W273 I.G.C.S.
402 West Washington Street
Indianapolis, IN 46204
317-232-4080

Or contact your local Soil and Water Conservation District.
Call *317-692-7325* to get the phone number of your local SWCD office.

Other Materials

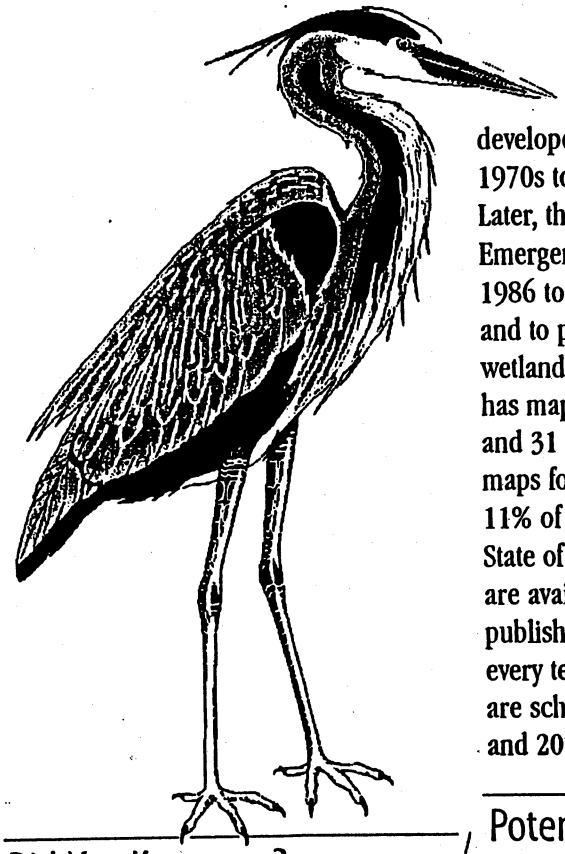
BMPs for Mosquito Control and Freshwater Wetlands Management (New Jersey Office of Mosquito Control Coordination, P.O. Box 400, Trenton, NJ 08625-0400, phone: 609-292-3649)

This has been funded wholly or in part by the **United States Environmental Protection Agency** *under assistance agreement No. CD985279-01-0 to the* **Indiana Department of Natural Resources**. *The contents of this document do not necessarily reflect the views and policy of the Environmental Protection Agency, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.*

Indiana Wetlands Conservation Plan

Fact Sheet

National Wetlands Inventory Maps



Did You Know . . . ?

Do you deal with wetlands? Do you need to know the location, size, type, and other information about wetlands in a particular area? If so, National Wetlands Inventory maps may be able to help.

Background

The National Wetlands Inventory (NWI) system is a system of mapping wetlands in the U.S. NWI maps are 7.5-minute U.S. Geological Survey topographic maps that have additional information on water bodies and wetlands. The U.S. Fish & Wildlife Service (USFWS) developed the NWI system in the late 1970s to use for wildlife inventories. Later, the USFWS was directed by the Emergency Wetland Resources Act of 1986 to continue mapping U.S. wetlands and to produce a computerized (digital) wetlands database. As of 1998, the NWI has mapped 89% of the lower 48 states and 31 % of Alaska, and has digitized maps for 39% of the lower 48 states and 11% of Alaska. All NWI maps for the State of Indiana have been digitized and are available to the public. The USFWS publishes 'status and trends' reports every ten years; future national updates are scheduled for the years 2000, 2010, and 2020.

Potential Uses of NWI Maps

Good planning protects wildlife habitat, preserves water quality, provides flood protection, enhances groundwater recharge, and preserves many other wetland functions and benefits. NWI maps are used by all levels of government, academia, Congress, private consultants, land developers, and conservation organizations. Private landowners also use the maps extensively for a wide range of applications. Uses include the following:

Municipal Planning---watershed and drinking water supply protection; solid waste facilities construction; and determining the location of transportation corridors, schools, and other buildings.

Private Sector Planning---determining the location and nature of wetlands to help develop alternative plans in order to meet regulatory requirements; preventing problems from developing; providing facts that allow sound business decisions to be made quickly, accurately, and efficiently.

Resource Managers---management and acquisition of wildlife habitat, especially waterfowl; fisheries restoration; floodplain planning; development and implementation of endangered species recovery plans.

Regulatory Agencies---preliminary wetland identification and determining wetland types.

Only a Preliminary Tool

The NWI maps are a preliminary tool for determining jurisdictional wetlands for regulation under Section 404 of the Clean Water Act (the "Corps' permit" program). The maps alone are not sufficient for determining if a wetland is present for this purpose. A wetland delineation must be done on-site, by a trained investigator examining soils, water indicators, and plants using the method described in the 1987 Delineation Manual. For more details, consult the

Corps (www.usace.army. mil/inet/functions/cw/cecwo/reg). For wetlands in agricultural settings, consult your local Natural Resources Conservation Service office for assistance.

How is the NWI System Different from the Army Corps of Engineers System?

The NWI system is described in detail in the document entitled "Classification of Wetlands and Deepwater Habitats of the United States" by Lewis M. Cowardin et. al., published by the USFWS in 1979. The NWI system, which was originally developed for wildlife inventory purposes, predated the U.S. Army Corps of Engineers' (Corps) 1987 Wetland Delineation Manual, which is used for jurisdictional and regulatory purposes. The NWI system focuses on water indicators and landscape location, and does not require that wetlands possess all 3 criteria specified in the Corps' manual and regulatory program (water indicators, hydric soil, and wetland vegetation).

Proper Use of NWI Maps

The User's Guide to National Wetland Inventory Maps, published by the USFWS in June 1993 states, "When using NWI maps, it is important to remember that the NWI is inventorying all wetlands without emphasis on any particular type or location, nor is it restricted to wetlands regulated by Federal, State or local regulatory agencies." The User's Guide also points out that all map products contain special notes to the effect that:

- the aerial photography analysis has an inherent margin of error.
- the system is not intended to coincide with jurisdictions of wetland regulatory agencies.

Important Precautions

- Know the dates of the NWI maps you use, remembering that changes in land use and wetlands could have occurred since that time.
- There are always limitations inherent in map scale.
- Because NWI maps have been prepared from aerial photographs, they can be less accurate for locating wetlands in forested areas.

For More Information

To find out more about the National Wetlands Inventory, visit the NWI website at www.nwi.fws.gov, or contact the Indiana Department of Natural Resources at:

IDNR Division of Fish and Wildlife

Room W273 I.G.C.S.
402 West Washington Street
Indianapolis, IN 46204
317 232-4080

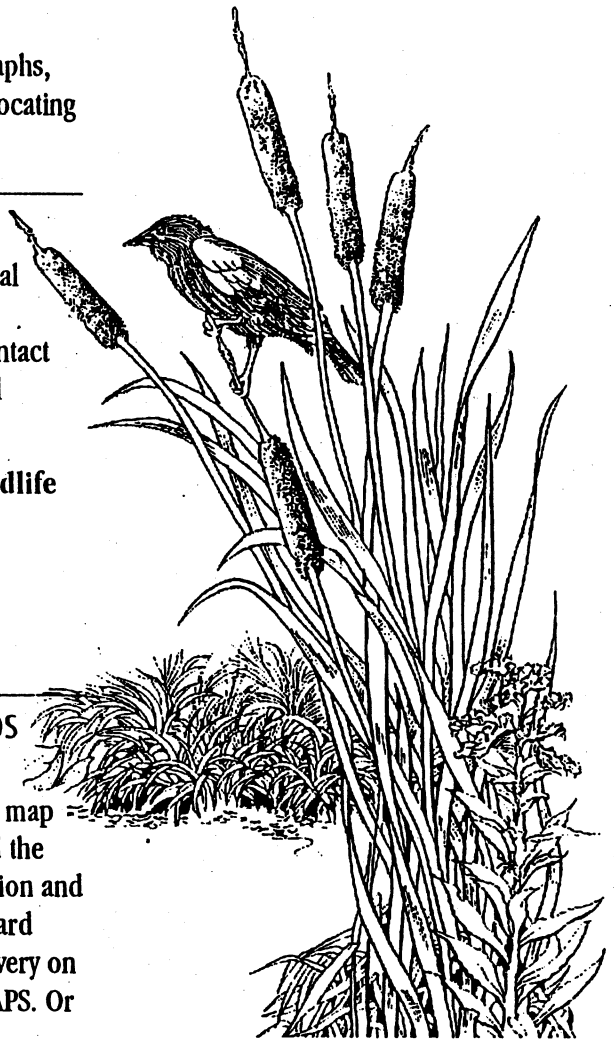
How to Obtain NWI Maps

If you can locate the area of interest on a U.S.G.S. topographic map first, it will be much easier to find the site on an NWI map. For information and product availability, or to order hard copy maps or digital data for delivery on magnetic tape, call 1-800-USA-MAPS. Or you can contact Indiana's state distribution center at:

Indiana DNR
Map Sales Division

402 W. Washington St., W160
Indianapolis, IN 46204-2742
317 232-4180

If you have access to the Internet, you can download data from the NWI website (www.nwi.fws.gov).



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Northwest Indiana Advance Identification of Wetlands (ADID)

What is the Northwest Indiana ADID?

USEPA is sponsoring a wetlands study in Northwest Indiana through a grant to the Northwestern Indiana Regional Planning Commission. The study is an Advance Identification of Wetlands (ADID) project which will result in a mapped inventory and functional assessment of area wetlands. The final map and data base will be distributed in hard copy and digital (ArcInfo) formats to community planners, developers, landowners, conservationists, regulators, researchers, and the general public. Members of local, state, and federal governmental agencies, land conservancies, businesses, universities, and environmental groups are cooperating to complete the project.

The project began in 1996 in response to these locally expressed concerns:

1) existing wetlands maps are outdated and provide limited information,
2) Northwest Indiana is experiencing an accelerated wetlands loss from rapid urbanization,
3) baseline information on wetland is needed to plan for development while protecting the natural resource values of the region.

Study Area

The study area is the portions of Lake, Porter, and LaPorte Counties that are within the Lake Michigan basin. Additionally, the LaPorte Lakes and the Valparaiso Lakes regions within the Kankakee basin will be studied because they are high quality, high social value lakes that are threatened by urbanization effects (increased runoff, sediment and nutrient loadings, and loss of habitat).

Wetland Assessment Methodology

A subset of wetland functions that are considered to be locally important was selected for the study. These functions are: storm water storage, sediment and toxicant retention, nutrient removal and transformation, wildlife habitat, and floristic diversity. The methodology developed for the study borrows heavily from a recently completed ADID in McHenry County, Il., which in turn is based on other established methodologies: the Wetland Evaluation Technique (WET), Adamus et al, the Oregon method, and the Illinois Natural Areas Inventory Methodology. Because the study area contains nearly 7500 wetlands, and the project has limited resources, a series of screening steps such as excluding sites smaller than five acres have been incorporated into the methodology.

Base Map

A GIS base map was developed using the National Wetlands Inventory (NWI), with overlays of coverages such as hydrologic boundaries, Nature Preserves and other protective ownership, the Little Calumet River Flood Control and Recreation Project, the Indiana Harbor and Shipping Canal Area of Concern, and data collected from reviewing aerial photos such as which wetlands have been developed since the NWI was completed in 1982.

Northwest Indiana Advance Identification of Wetlands (cont'd)

Who will use the ADID:

Planners Principal beneficiaries of the ADID will be communities planning for development while protecting the natural resource values of wetlands. For example, the ADID will provide basic information to evaluate the likely trade-offs, or downstream consequences of flooding and erosion if specific wetlands within a watershed are allowed to be impacted. Communities will be encouraged to use the ADID information to protect important wetlands by enacting local flood control or wetlands protection ordinances.

Developers The ADID will assist the development community by inserting a degree of predictability into the wetland permitting process. High quality and high functional value wetlands in the study area will be identified and mapped. This *advance* information allows developers to avoid high quality wetlands while planning projects. The permitting process thus gains predictability, is streamlined, or is avoided entirely.

Regulatory Community The ADID will assist the Army Corps of Engineers (Corps) in review of permit applications by providing information about wetlands on a landscape level, thus enabling the evaluation of cumulative impacts from individual projects, including effects to the natural community and to flood potential. It should be noted that the ADID will be *advisory* to the Corps; applications for projects affecting ADID wetlands will be accepted and reviewed.

Public Education

Staff have drafted a public education strategy and time line that include several mechanisms for informing various groups and the public at large about the value of wetlands, and the purpose of the ADID.

Status in brief:

The study area has been divided into 12 sub-basins within the three counties with corresponding field teams to complete the photo interpretation and field checks. The photo work is completed in 11 of the basins and field work is completed for two of the basins. The field work is anticipated to be complete by October 1999. The final product is expected to be published in draft form for public review by December 1999, and completed by March 2000.

For more information, contact:

Carolyn Bury
Watersheds and Non-Point Source Programs Branch, EPA
312-886-3020

November 1998, USEPA, CB

Glossary

General Wetland Terms

Aerobic—living, active or occurring only in the presence of oxygen.

Anaerobic—living in the absence of oxygen.

Biodiversity—the sum of all species of plants and animals. An ecosystem is considered healthy when it supports the most diverse numbers and types of species it is capable of supporting.

Buffer zone—land adjacent to a sensitive area that minimizes outside impact.

Hydric soil—soil found in saturated, anaerobic environments; usually characterized by a gray or mottled appearance.

Hydric—characterized by or requiring considerable moisture.

Hydrology—the study of the properties, distribution, and effects of water on the Earth's surface, in soils and underlying rocks, and in the atmosphere.

Hydrophyte —vegetation that has adapted to thrive in wet conditions; typically found in wetland habitats.

Hydrologic regime—refers to how water enters and exits the wetland system.

Hydroperiod—the seasonal fluctuating pattern of the water level. It is affected by the weather, the season, **inflows** and outflows such as streams feeding into and draining from the wetland, the surrounding watershed, groundwater, and other water bodies int the area. In some prairie pothole systems, wet or dry cycles can last 10 to 20 years! Coastal and inland tidal marshes and wetlands along rivers have a pulsating hydroperiod, which means that the water level varies depending on the time of day or the season.

Wetland Communities in Indiana

(Based on Natural Community Classifications, IDNR, Division of Nature Preserves.)

Acid bog (shrub/herb bog)—an acidic wetland of kettle holes in glacial terrain. Consists of low shrubs and mosses such as sphagnum. The bog can also be a floating, quaking mat. These systems have non-flowing or very slow flowing water that fluctuates seasonally.

Acid seep—a bog-like wetland that is groundwater-fed and located in upland terrains. It is characterized by flowing water during at least part of the year. It is naturally irrigated by the outflow of groundwater.

Circumneutral seep (seep-spring)—a groundwater-fed wetland on organic soils and is primarily herbaceous with a scattered tree canopy. Typically it is situated on the lower slopes of hills, particularly those bordering larger drainages. It is characterized by slowly flowing water during at least part of the year and is naturally irrigated by the outflow of groundwater.

Circumneutral bog (scrub bog)—a bog-like wetland that receives groundwater. These bogs can sometimes be found as a quaking or floating mat. The soils are usually peat or other low nutrient organic substrates, which are saturated and neutral to slightly acid. These systems have non-flowing or very slow flowing water that fluctuates seasonally.

Fen—calcareous, groundwater-fed wetlands. They are often a mosaic of grassy areas, sedgy areas, grass-sedge areas, and tall shrub areas. These systems have very slow flowing water in which the water level fluctuates seasonally.

Flatwoods—a forest on level upland terrain characterized by a mosaic of wet depressions and slightly elevated soils. Different types of flatwoods are differentiated by substrate and/or vegetation and/or geography (e.g., sand flatwoods, post oak flatwood, boreal flatwoods, and central till plain flatwoods). Soils are typically poorly drained. Water levels, an accumulation of direct precipitation (not flooding), are normally ephemeral above the soil surface.

Forested swamp—a permanently inundated wetland of large river bottoms. They normally occur in depressions and sloughs of the bottomlands. The soils are usually very poorly drained and is seasonally to permanently saturated or ponded.

Forested fen—a tree-dominated wetland on organic soil which receives groundwater. They are often a mosaic of tree areas, tall shrub areas, and herbaceous areas.

Gravel wash—a plant community occurring on gravely substrates along streams and rivers. Ground cover consists of mixed herbs, grasses, and vines with shrubs present at times. These communities are subject to brief but severe flooding.

Lake—a natural standing water body larger than four acres. Lakes have temperature stratification, and may have beaches formed from wave action. These communities have plant mosaic patches that correlate with water depth and types of substrates. Water levels may fluctuate seasonally, and there is little or no water flow.

Marl beach prairie—fen-like community located on the marly muck shorelines of lakes; the surface is firm and moist but not saturated, and marl precipitation is evident.

Marsh—herbaceous wetland of more or less permanent, non-flowing water bodies, either in lakes or water-filled depressions; water levels may fluctuate, but rarely recede to expose the soil surface.

Muck flat—a shoreline and lake community possessing a unique flora of sedges and annual plants, many of which are also found on the Atlantic and Gulf Coastal Plains. They are situated at the margins of lakes or are covering shallow basins. This system has a peat substrate and may float on the water surface, but during high water periods are usually inundated. The water level fluctuates seasonally or from year to year in response to the amount of precipitation.

Open Water—a wetland of less than 20 acres, the bottom of which has at least 25% cover of particles smaller than stones, and a vegetative cover less than 30%. They lack bottom surfaces large and stable enough for plant and animal attachment. Water regimes are subtidal, permanently and semipermanently flooded, and intermittently exposed.

Panne (calcareous seep)—an herbaceous wetland occupying interdunal swales near Lake Michigan. They are located on the lee side of the first or second line of dunes from the lakeshore. Pannes are naturally irrigated by the outflow of ground water.

Sand flat—a shoreline and lake community possessing a unique flora of sedges and annual plants that resemble those found on the Atlantic and Gulf Coastal Plains. They are found at the margins of lakes or covering shallow basins. This system has a sand substrate and during high water periods are inundated. The water level fluctuates during a season or from year to year in response to the amount of precipitation.

Sedge meadow—sedge-dominated wetland of stream margins and river floodplains, lake margins, or upland depressions. These systems usually occupy the ground between a marsh and upland, or a shrub swamp or wet forest. The substrate of a sedge meadow is typically highly organic, and is at or just above the water level.

Shrub swamp—a shrub-dominated wetland that is more or less permanently inundated. It commonly occurs in depressions. They are characterized by non-flowing or very slowly flowing water which fluctuates seasonally.

Sinkhole swamp—an unusual and small semi-permanently flooded wetland of limestone landscapes. They are located in depressions that were formed when underground chambers dissolved in a limestone plateau and collapsed. The water levels are more or less permanently elevated above the soil surface, but may dry down in drought conditions.

Sinkhole pond—a water-containing depression, generally smaller than four acres, in limestone topography; normally consists of open water and marshy borders with little or no water flow.

Wet prairie—herbaceous wetland that occurs in deep swales; substrates range from very black mineral soils to muck.

Wet sand prairie—herbaceous wetland that occurs in deep swales; substrate is sand (sometimes mixed with muck).

Wet floodplain forest (bottomland hardwood forest)—a broadleaf deciduous forest of river floodplains. It has traits of long flooding and hydric soils that are intermediate between wetlands and terrestrial systems.

Wet-mesic floodplain forest—a broadleaf deciduous forest of river floodplains. A great diversity of tree species is found in these systems as compared to the wet floodplain forest type. These systems have imperfectly and poorly-drained neutral silt loam soils which are poorly aerated. Despite flooding, the soils and flora suggest a terrestrial rather than palustrine system.

Wet-mesic sand prairie—upland herbaceous community dominated by grasses, and occurring in shallow swales or lower slopes of sand plains; substrate is typically sand or loamy sand.